

## SEQUENCE LISTING

**SEQ ID NO: 1**

MVLLYSQASWDKRSKADALVLPFWMKNSKAQEAAVVDEDEDYKLVYQNALSNFSGKKKG  
 ETAFLFGNDHTKEQKIVLLGLGKSEEVSGTTVLEAYAQAATTVLRKAKCKTVNILLPTISQ  
 LRFSVEEFLTNLAAGVLSLNNYPTYHKVDTSLPFLEKVTVMGIVSKVGDKIFRKEESLF  
 EGVYLTRDLVNTNADEVTPKLA AVAKDLAGEFASLDVKILDRKAILKEKMGLLA AVA  
 KGAAVEPRFIVLDYQGKPKSKDRTVLIGKGVTFDSGGLDLKPGKAMITMKEDMAGAAT  
 VLGIFSALASLELPINVTGIIPATENAIGSAA YKMGDVYVGMTGLSVEIGSTDAEGRILA  
 DAISYALKYCNPTRIIDFATLTGAMVVSLGESVAGFFANNDVLARDLAEASSETGEALW  
 RMPLVEKYDQALHSDIADMKNIGSNRAGSITAALFLQRFLEDNPV AWAHLDIAGTAYHE  
 KEELPYPKYATGFGVRCLIH YMEKFLSK

**SEQ ID NO: 2**

MTASGGAGGLGSTQTV DVARAQAAAATQDAQEVIGSQEASEASMLKGCEDLINPAAAT  
 RIKKKGEKFESLEARRKPTADKA EKKSESTE EKGDTPLED RFTEDLSEVSGEDFRGLKNS  
 FDDSSPDEILDALTSKFS DPTIKDLALDYLIQTAPSDGKLKSTLIQAKHQLMSQNPQAIV  
~~GGRNVLLASETEASRANTSPSSLRSLYEQVTSSPSNCANLHQMLAS YLPSEKTAVMEFLV~~  
 NGMVADLKSEGPSIPPAKLQVYMTLSNLQALHSVNSFFDRNIGNLENSLKHEGHAPIPS  
 LTTGNLTKTFLQLVEDKFPSSSKAQKALNELVGPDTGPQTEVLNLF FRALNGCSPRIIFSGA  
 EKKQQLASVITNTLDAINADNEDYPKPGDFPRSSFSSTPPHAPVPQSEIPTSTSTQPPSP

**SEQ ID NO: 3**

MCIKRKKTWIAFLAVVCSFCLTGCLKEGGDSNSEKFIVGTNATYPPFEFVDKRGEVVGF D  
 IDLAREISNKLGKTLDVREFSFDALILNLKQHRIDAVITGMSITPSRLKEILMIPYYGEEIKH  
 LVLVFKGENKHPLPLTQYRSVAVQTGT YQEAYLQSLSEVHIRSFDSTLEVLMEVMHGKS  
 PVA VLEPSIAQVV LKDFPALSTATIDL PEDQWVLGYGIGVASDRPALALKIEAAVQEIRKE  
 GVLAELEQKWGLNN

**SEQ ID NO: 4**

MSEKRKSNKIIGIDL GTTNSCVSVM EGGQPKVIASSEGTRTTPSIVAFKGGETLVGIPAKR  
 QAVTNPEKTLASTKRFIGRK FSEVESEIKTVPYKVAPNSKGDAVFDVEQKLYTPEEIGAQI  
 LMKMKETA EAYLGETVTEAVITVPA YFNDSQRASTKDAGRIAGLDVKRIIPEPTAAALA  
 YGIDKEGDKKIAVFDLGGGT FDISILEIGDGVFEVLSTNGDTHLGGDDFDGVIINWMLDEF  
 KKQEGIDLSKDNMALQRLKDAAEKAKIELSGVSSTEINQPFITIDANGPKHLALTLTRAQF  
 EHLASSLIERTKQPCAQALKDAKLSASDIDDVLLVGGMSRMPAVQAVVKEIFGKEPNKG  
 VNPDEVVAIGAAIQGGV LGGEVKDVLLLDVIPLSLGIETLGGVMTPLVERNTTIPTQKKQI  
 FSTAADNQP AVTIVVLQGERPMAKDNKEIGRFDLTDIPPAPRGHPQIEVTFDIDANGILHV  
 SAKDAASGREQKIRIEASSGLKEDEIQQMIRDAELHKEEDKQRKEASDVKNEADGMIFRA  
 EKAVKDYHDKIPAELVKEIEEHIEKVRQAikedASTTAIKAASDELSTHMQKIGEAMQAQ  
 SASAAASSAANAQGGPNINSEDLKKHSFSTRPPAGGSASSTDNIEDADVEIVDKPE

**SEQ ID NO: 5**

MHDALQSILAIQELDIKMIRLMRVKKEHQNELAKIQALKTDIRRKVEEKEQEMEKLKDQI  
 KGGEKRIQEISDQINKLENQQA AVKKMDEFNALTQEMTAANKERRTLEHQLSDLMDKQ  
 AGSEDLLISLKESSLSTENSSSAIEEEIRENIRKINEEGRSLLSQRTQLKETTDPELFSIYERL  
 LNNKKDRVVVPIENRVCSGCHIALTPQHENLVRKQDHLVFCEHCSRILYWQELQSPSAE  
 GATTKRRRRRTAV

**SEQ ID NO: 6**

MKKFLLLSLMSLSSLPTFAANSTGTIGIVNLRRCLEESALGKKESAEEFEKMKNQFSNSMG  
KMEEELSSIYSKLQDDDYMEGLSETAAAELRKKFEDLSAEYNTAQGQYYQILNQSNLKR  
MQKIMEEVKKASETVRIQEGLSVLLNEDIVLSIDSSADKTDAAVIKVLDDSFQNN

**SEQ ID NO: 7**

MTTESLETLVEQLSGLTVLELSQLKKLLEEKWDVTAAPVAVAGAAAAGDAPASAEP  
TEFAVILEDVPSDKKIGVLKVREVTGLALKEAKEMTEGLPKTVKEKTSKSDAEDTVKK  
LQEAGAKAVAKGL

**SEQ ID NO: 8**

MKKTALLAALCSVVSLSSCCRIVDCCFEDPCAPIQCSPCESKKKDVDGGCNSCNGYVPA  
CKPCGGDTHQDAKHGPQARGIPVDGKCRQ

**SEQ ID NO: 9**

MPKIDTCDSVCVSNTELLAIRTRVTQSYNEAQTILSSIPDGIFLLSESGEILICNPQARAILGIP  
EDIQLVTRMFHDFPDFTFFGFSVQEALEKEVPPKTIRLTLSQELSQKEVEVFVRKNISHDFL  
FLLIRDRSDYRQLEQAIEKYRSISELGKIAATLAHEIRNPLTSISGFATLLKEELSSERHQRM  
LNVIEGTRSLNSLVSSMLEYTKIQPLNLRSIDLODFESSLIPELSLTFPSCTFRRITLSPIQRSI  
DPDRLRCVIWNLVKNASVEASDEEIFLELHEKGFSVINTGTLPPNIQEKLFIPFFTTKPQGNG  
LGLAEAHKIMRLHGGDLVVSTQDNRTTFTILWTPA

**SEQ ID NO: 10**

MKVILRALCLFLVLPCGCYARVPSFEPFRGAIAPNRYTPKHSPELYFEMGDKYFQAKKFK  
QALLCFGMITHHFPEHALHPKAQFLVGLCYLEMGHPDLADKALTQYQELADTEYSEQLF  
AIKYSIAQSFANGKRKNIVPLEGFPKLLKADTDALRIFEIVTASSDADLKASALYAKGAL  
LFDRKEYSEAIKTLKKVSLQFSPHSLSPEFTLIAKIHCLQALQEPYNEQYLQDARMNAAA  
LRKQHPNHPSNTEVENYIHHMCEAYASCLYSTGRFYEKKRKASSAKIYYSIALENFPDTS  
YVAKCNKRLERLSKQMS

**SEQ ID NO: 11**

MFDVVISDIEAREILDSRGYPTLCVKVITNTGTGFEACVPSGASTGIKEALELRDKDPKRY  
QGKGVLAISNVEKVLMPALQGFSVFDQITADAIMIDADGTPNKEKLGANAILGVSLAL  
AKAAANTLQRPLYRYLGGSFHVLPCPMMNLINGGMHATNGLQFQEFMIRPISAPSLTE  
AVRMGAEVFNALKKILQNRQLATGVGDEGGFAPNLASNAEALDLLTAIETAGFTPRED  
ISLALDCAASSFYNTQDKTYDGKSYADQVGILAECEHYPIDSIDGLAEEDFEGWKLLS  
ETLGDRVQLVGDDLFTVNSALIAEGIAQGLANAVLIKPNQIGTLTETAIAIRLATIQGYAT  
ILSHRSGETEDTTIADLAVAFNTGQIKTGSLSRSERIAKYNRLMAIEEEMGPEALFQDSNPF  
SKA

**SEQ ID NO: 12**

MMKRLLCVLLSTSVFSSPMLGYSASKKDSKADICLAVSSGDQEVSQEDLLKEVSRGFSR  
VAAKATPGVVYIENFPKTGNQAIASPGNKRGFQENPFDYFNDEFFNRFFGLPSHREQQRP  
QQRDAVRGTGFIVSEDGYVVTNHHVVEDAGKIHVTLHDGQKYTAKIVGLDPKTDLAVI  
KIQAEKLPFLTFGNSDQLQIGDWAIAIGNPFGLQATVTVGVISAKGRNQLHIVDFEDFIQT  
DAAINPGNSGGPLLNINGQVIGVNTAIVSGSGGYIGIGFAIPSLMAKRVIDQLISDGQVTRG  
FLGVTLQPIDSELATCYKLEKVYGALVTDVVKGSPAEEKAGLRQEDVIVAYNGKEVESLS  
ALRNAISLMMPGTRVVLKIVREGKTIEIPVTVTQIPTEDGVSAEQKMGVRVQNITPEICKK  
LGLAADTRGILVVAVEAGSPAASAGVAPGQLILAVNRQRVASVEELNQVLKNSKGENVL  
LMVSQGDVVRFIVLKSDE

**SEQ ID NO: 13**

MKKINKIVLAVGGTGGHIIPALAAARETFIHEDIEVLLLKGKGLAHFLGDDSEVAYCDIPSGS  
 PFSLRVNRMFSGAKQLYKGYVAALQKIRDFTPDLAIGFGSYHSLPAMLASIRSRIPLFLHE  
 QNIVPGKVNKLFSRFAKGVGMSFAAAGEHFHCRAEEVFLPIRKLSEQIVFPGASPVICVV  
 GGSQGAKILNDVVPKALARIRESYSNLYVHHIVGPKGDLQAVSQVYQDAGINHTVTAFD  
 HNMLGVLQASDLVISRSGATMLNELLWVQVPAILIPYPGAYGHQEVNAKFFTHTVGGGT  
 MILQKYLTEESLSKQVLLALDPATSENRRKAMLSAQQKKSFKSLYQFICESL

**SEQ ID NO: 14**

MGNSGFYLYNTQNCVFADNIKVGQMTEPLKDQQIILGTTSTPVA AKMTASDGLSTVSN  
 NPSTNASITIGLDAEKAYQLILEKLGDQILGGIADTIVDSTVQDILDKITTDPSLGLLKAFN  
 NFPITNKIQCNGLFTPRNIETLLGGTEIGKFTVTPKSSGSMFLVSADIASRMEGGVVLALV  
 REGDSKPYAISYGYSSGVPNLCSLRTRIINTGLTPTTYSRLRVGGLESGVVWVNALSNGNDI  
 LGITNTSNVSFLEVIPQTNA

**SEQ ID NO: 15 (pmpA)(CT412)**

MNRVIEIHAHYDQRQLSQSPNTNFLVHHPYLTLPKFLLGALIVYAPYSFAEMELAISGHK  
 QGKDRDTFTMISSCPEGTNYIINRKLILSDFSLLNKVSSGGAFRNLAGKISFLGKNSSASIH  
~~EKHININGEGAGVFESESSIEFTDLRKLVAEGSESTGGIFTAKEDISEKNNHHIAERNNTKGN~~  
 GGVIQLQGDMKGSVSFVDQRGAIIFTNNQAVTSSSMKHSGRGGAISGDFAGSRILFLNNQ  
 QITFEGNSAVHGGAIYNKNGLVEFLGNAGPLAFKENTTIANGGAIYTSNFKANQQTSPILF  
 SQNHANKKGGAIYAQYVNLEQNQDTIRFEKNTAKEGGGAISSQCSITAHNTIIFSDNAA  
 GDLGGGAILLEGKKPSLTIAHSGNIAFSGNTMLHITKKASLDRHNSILIKEAPYKIQLAA  
 NKNHSIHFFDPVMALSASSSPIQINAPEYETPFFSPKGMIVFSGANLLDDAREDVANRTSIF  
 NQPVHLYNGTLSIENGAHLIVQSFKQTGGRISLSPGSSLALYTMNSFFHGNISSKEPLEING  
 LSFVGVDISPSNLQAEIRAGNAPRLSLGSPSIHDPEGLFYENRDTAASPYQMEILLTSDKIVDI  
 SKFTTDSLVTNKQSGFQGAWHFSWQPNTINNTKQKILRASWLPTGEYVLESNRVGRAVP  
 NSLWSTFLLLQTASHNLGDHLCNNRSLIPTSIFGVVLIGGTGAEMSTHSSEEEESFISRLGAT  
 GTSIIRLTPSLTLSGGGSHMFGDSFVADLPEHITSEGIVQNVGLTHVWGPLTVNSTLCAAL  
 DHNAMVRICKKDHITYGKWDTFGMRGTLGASYTFLEYDQTMRVFSFANIEATNILQRA  
 FTETGYNPRSFSKTKLLNIAPIGIGYEFCLGNSSFALLGKGSGIGYSRDIKRENPSSTLAHLAM  
 NDFAWTTNGCSVPTSAHTLANQLILRYKACSLYITAYTINREGKNLSNSLSGCGGYVGF

**SEQ ID NO: 16 (pmpB)(CT413)**

MKWLSATAVFAAVLPSVSGFCFPEPKELNFSRVGTSSSTTFTETVGEAGAEYIVSGNASF  
 TKFTNIPTTDTTPTNSNSSSSNGETASVSESDSTTTTPDPKGGGAFYNAHSGVLSFMTR  
 SGTEGSLTLSEIKITGEGGAIFSQGELLFTDLTGLTIQNNLSQLSGGAIFGESTISLSGITKAT  
 FSSNSAEVPAPVKKPTPEPKAQTASETS GSSSSSSGNDVSSPSSSRAEPAAANLQSHFICATA  
 TPAAQTD TETSTPSHKPGSGGAIYAKGDLTIADSQEVLF SINKATKDGGAIFAEKDV SFEN  
 ITSLKVQTNGAEKGGAIYAKGDL SIQSSKQSLFNSNYSKQGGGALYVEGDINFQDLEEIR  
 IKYNKAGTFETKKITLPKAQASAGNADAWASSSPQSGSGATTVSNSGDSSSGSDSDTSET  
 VPATAKGGGLYTDKNLSITNITGIIELANNKATDVGGGAYVKGT LTCENSHRLQFLKNSS  
 DKQGGGGIYGEDNITLSNLTGKTLFQENTAKEEGGGLFIKGTDKAL TMTGLDSFCLINNTS  
 EKHGGGAFVTKESQTYTSDVETIPGITPVHGETVITGNKSTGGNGGGVCTKRLALS NLQ  
 SISISGNSAAENGGAHTCPDSFPTADTAEQPAAASAATSTPESAPVVSTALSTPSSSTVSS  
 LTLAASSQASPATSNKETQDPNADTDLLIDYVVDTTISKNTAKKGGGGIYAKKAKMSRID  
 QLNISENSATEIGGGICCKESLELDALVSLSVTENLVGKEGGGLHAKTVNISNLKSGFSFS  
 NNKANSSSTGVATTASAPAAAAAASLQAAAAAVPSSPATPTYSGVVGGAIYGEKVTF SQC  
 SGTCQFSGNQ AIDNNPSQSSLNVQGGAIYAKTSLSIGSSDAGTSYIFSGNSVSTGKSQTTG  
 QIAGGAIYSPTVTLNCPATFSNNTASMATPKTSSSEDGSSGNSIKDTIGGAIAGTAITLSGVS  
 RFSGNTADLGAAIGTLANANTPSATSGSQNSITEKITLENGSFIFERNQANKRGAIYSPSVS  
 IKGNNTIFNQNTSTHDGSAIYFTKDATIESLGSVLFTGNNVTATQASSATSGQNTNTANY



GAAIFGDPGTTQSSQTDAILTLLASSGNITFSNNSLQNNQGDTPASKFCSIAGYVKLSLQA  
 AKGKTISFFDCVHTSTKKIGSTQNVYETLDINKEENSNPYTGTVFSSSELHENKSYIPQNAI  
 LHNGTLVLKEKTELHVVSFEQKEGSKLIMKPGAVLSNQNIANGALVINGLTIDLSSMGTP  
 QAGEIFSPPELRIVATTSSASGGSGVSSSIPTNPKRISAAAPSGSAATTPTMSENKVFLTGD  
 TLIDPNGNFYQNPMLGSDLDVPLIKLPTNTSDVQVYDLTSLGDLFPQKGYMGWTWTLDSN  
 PQTGKLQARWTFDITYRRWVYIPRDNHFIANSILGSQNSMIVVKQGLINNMLNNAFDDI  
 AYNFWVSGVGTFLAQQTPLSEEFSSYYSRGTSVAIDAKPRQDFILGAAFSKMVGKTKA  
 IKKMHNHYFHKGSEYSYQASVYGGKFLYFLLNKQHGWAFLPFLIQGVVSYGHIKHDTTTL  
 PSHERNKGDWEDLGWLADLRISMDLKEPSKDSSKRITVYGELEYSSIRQKQFTEIDYDPR  
 HFDDCAYRNLSLPVGCAVEGAIMNCNLMYNKLALAYMPSTYRNNPVCKYRVLSSNEA  
 GQVICGVPTRTSARAESTQLYLGPFWTLYGNYTIDVGMYTLSQMTSCGARMIF

**SEQ ID NO: 17 (pmpC)(CT414)**

MKFMSATAVFAAALSSVTEASSIQDQIKNTDCNVSKLGYSTSQAFTDMMLADNTEYRA  
 ADSVSFYDFSTSSRLPRKHLSSSSEASPTTEGVSSSSSGETDEKTEEELDNGGIIYAREKLT  
 SESQDSLSNQSIELHDNSIFFGEGEVIFDHRVALKNNGGAIYGEKEVVFENIKSLLVEVNIAV  
 EKGGSVYAKERVSLENVTEATFSSNGGEQGGGGIYSEQDMLISDCNNVHFQGNAAAGAT  
AVKQCLDEEMIVLLAECVDSLSEDTLDSTPETEQTESNGNQDGSSEETEDTQVSESPESTPS  
 PDDVLGKGGGIYTEKSLTITGITGTIDFVSNLATDSGAGVFTKENLSCTNTNSLQFLKNSA  
 GQHGGGAYVTQTMSTVNTTSESITTPPLIGEVIFFSENTAKGHGGGICTNKLSSLNLKTVTL  
 TKNSAKESGGAIFTDLASIPITDTPESSTPSSSSPASTPEVVASAKINRFFASTAKPAAPSLTE  
 AESDQTDQTETSDTNSDIDVSIENILNVAINQNTSAKKGGAIYGKKAKLSRINNLELSGNS  
 SQDVGGGLCLTESVEFDAIGSLLSHYNSAAKEGGAIHSKTVTLNLKSTFTFADNTVKAI  
 VESTPEAPEEIPPVEGEESTATEDPNSNTEGSSANTNLEGSQGDADTGTGDVNNESQDTS  
 DTGNAESEEQLQDSTQSNEENTLPNSNIDQSNENTDESSDSHTEETDESVSSESSESSTP  
 QDGGAAASSGAPSGDQSIANACLAKSYAASTDSSPVSNSSGSEEPVTSSSDSDVTASSDNP  
 DSSSSGDSAGDSEEPTEPEAGSTTETLTLLIGGGAIYGETVKIENFSGQGIFSGNKAIDNTTE  
 GSSSKSDVLGGAVYAKTLFNLDGSSRRTVTFSGNTVSSQSTTGQVAGGAIYSPTVTIATP  
 VVFSKNSATNNANNTTDTQRKDTFGGAIGATSAVSLSGGAHFLENVADLGSAIGLVPGT  
 QNTETVKLESGSYFEKNKALKRATIIYAPVVSIIKAYTATFNQNRSLIEGSAIYFTKEASIE  
 SLGSLVFTGNLVTLLSTTTEGTPATTSGDVTKYGAIFGQIASSNGSQTDNLPLKLIASG  
 GNICFRNNEYRPTSSDTGTSTFCSIAGDVKLTMQAAKGKTISFFDAIRTSTKKTGTQATAY  
 DTLINKSEDSETVNSAFTGTILFSSSELHENKSYIPQNVVLHSGSLVLKPNTLHVISFEQK  
 EGSSLVMTPGSLVSNQTVADGALVINNMIDTLSSVEKNGLAEGNIFTPELRIDTTTGGSG  
 GTPSTDSESNQNSDDTEEQNNNDASNQGESANGSSSPAVAAAHTSRTRNFAAAATATPT  
 TTPTATTTTTSNQVILGGEIKLIDPNGTFFQNPALRSDQQISLLVLPTDSSKMQAQKIVLTGD  
 IAPQKGYTGTLTLDPDQLQNGTISVLWKFDYSRQWAYVPRDNHFIANSILGSQMLMVT  
 VKQGLLNDKMNLARFEVSYNNLWISGLGTMLSQVGTPTSEEFTYYSRGASVALDAKP  
 AHDVIVGAAFSKMIGKTKSLKRENNYTHKGSEYSYQASVYGGKPFHFVINKKTEKSLPL  
 LLQGVISYGYIKHDTVTHYPTIRERNKGEWEDLGWLTALRVSSVLRTPAQGDTKRITVY  
 GELEYSSIRQKQFTETEDPRYFDNCTYRNLAIPMGLAFEGELSGNDILMYNRFSVAYML  
 SIYRNSPTCKYQVLSSGEGGEIICGVPTRNSARGEYSTQLYLGPLWTLYGSYTIEADAHTL  
 AHMMNCGARMTF

**SEQ ID NO: 18 (pmpD)(CT812)**

MSSEKDIKSTCSKFSLSVVAAILASVSGLASCVDLHAGGQSVNELVYVGPQAVLLLDQIR  
 DLFVGSKDSQAEGQYRLIVGDPSSFQEKDADTLPGKVEQSTLFSVTNPVVFQGVDDQDQ  
 VSSQGLICSFTSSNLDSPRDGESFLGIAFVGDSKAGITLTDVKASLSGAALYSTEDLIFEKI  
 KGGLEFASCSSLEQGGACAAQSILIHDCQGLQVKHCTTAVNAEGSSANDHLGFGGGAFF  
 VTGSLSGEKSLYMPAGDMVVANCDGAISFEGNSANFANGGAIAASGKVLVANDKKTS  
 FIENRALSGGAIAASSDIAFQNCALVFKGNCAIGTEDKGSLLGGGAISSLGTVLLQGNHGI

TCDKNESASQGGAI FGKNCQISDNEGPVVFRDSTACLGGGAIAAQEIVSIQNNQAGISFEG  
 GKASFGGGIACGSFSSAGGASVLGTIDISKNLGAISFSRTLCTTSDLGQMEYQGGGALFGE  
 NISLSENAGVLTFKDNIVKTFASNGKILGGGAILATGKVEITNNSEGISFTGNARAPQALPT  
 QEEFPLFSKKEGRPLSSGYSGGGAILGREVAILHNAAVVFEQNRLQCSEEEATLLGCCGG  
 GAVHGMDSSTIVGNSSVRFGN NYAMGQGVSGGALLSKTVQLAGNGSVDFSRNIASLGG  
 GALQASEGNCELVDNGYVLFRDNRGRVYGGAISCLRGDVVISGNKGRVEFKDNIATRLY  
 VEETVEKVEEVEPAPEQKDNNELSFLGRAEQSFITAANQALFASEDGDLSPESSISSEELA  
 KRRECAGGAIFAKRVRIVDNQEA VVFSNNFSDIYGGAI FTGSLREEDKLDGQIPEVLISGN  
 AGDVVFSGNSSKRDEHLPHTGGGAICTQNL TISQNTGNVLFYNNVACSGGAVRIEDHGN  
 VLLEAFGGDIVFKGNSSFRAQGSDAIYFAGKESHITALNATEGHAIVFHDALVFENLEER  
 KSAEVLLINSRENPGYTGSIRFLEAESKVPQCIHVQQGSLELLNGATLCSYGFQDAGAK  
 LVLAAGAKLKILDSGTPVQQGHAISKPEAEIESSEPEGAHSLWIAKNAQTTPMVDIHTI  
 SVDLASFSSSQEGTVEAPQVIVPGGSYVRS GELNLELVNTTGTGYENHALLKNEAKVPL  
 MSFVASGDEASAEISNLSVSDLQIHVVTPEIEEDTYGHMGDWSEAKIQDGTLVISWNPTG  
 YRLDPQKAGALVFNALWEEGAVLSALKNARFAHNLT AQRMEDYSTNVWGFAGGFR  
 TLSAENLVAIDGYKGAYGGASAGVDIQLMEDFVLGVSGAAFLGKMDSQKFDAEVSRKG  
 VVGSVYTGFLAGSWFFKGQYSLGETQNDMKTRYGV LGESSASWTSRGVLADALVEYRS  
 LVGPVRPTFYALHENPYVEVSYASMKEPGETEQGREARSEFEDASLTNITPLGMKEELAEI  
 KGQFSEVNSLGISYAW EAYRKVEGGA VQLLEAGFDWEGAPMDLPRQELRVALENTE  
 WSSYFSTVLGLTAF CGGFTSTDSKLG YEANTGLRLIF

**SEQ ID NO: 19 (pmpE)(CT869)**

MKKAFFFFLIGNSLSGLAREVPSRIFLMPNSVPDPTKESLSNKISLTGDTHNLTNLCYLDNL  
 RYILAILQKTPNEGAAVTITDYL SFFDTQKEGIYFAKNLTPESGGAIGYASPNSTVEIRD TI  
 GPVIFENNTCCRLFTWRNPYAADKIREGGAIHAQNLYINHNDVVGFMKNFSYVQGGAI  
 STANTFVVSENQSCFLFMDNICIQNTAGKGGAIYAGTSNSFESNNCDLFFINNACCAGG  
 AIFSPICSLTGNRGNIVFYNNRCFKNVETASSEASDGGAIKVTTRLDVTGNRGRIFFSDNIT  
 KNYGGAIYAPVVTLVDNGPTYFINNIANNKGGAIYIDGTSNSKISADRHAIIFNENIVTNV  
 TNANGTSTSANPPRRNAITVASSSGEILLGAGSSQNLI FYDPIEVSNAGVSVSFNKEADQT  
 GSVVFSGATVNSADFHQRNLQTKTPAPLTL SNGFLCIEDHAQLTVNRFTQTGGVVSLGN  
 GAVLSCYKNGTGDSASNASITLKHIGLNLSSILKSGAEIPLLWVEPTNNSNNYTADTAATF  
 SLSDVKLSLIDDYGN SPYESTDLTHALSSQPMLSISEASDNQLQSENIDFSGLNVPHYGWQ  
 GLWTWGWAKTQDPEPASSATITDPQKANRFHRTL LLLTWLPAGYVPSPKHRSPLIANTLW  
 GNMLLATESLKNSAELTPSGHPFWGITGGGLGMMVYQDPRENHPGFHMRSSGY SAGMI  
 AGQTHTFSLKFSQTYTKLNERYAKNNVSSKNYSCQGEMLFSLQEGFLLTKLVGLYSYGD  
 HNCHEFYTQGENLTSQGTFRSQT MGGAVFFDLPMKPFGSTHILTAPFLGALGIYSSLSHF  
 TEVGAYPRSFSTKTPLINVLVPIGVKGSFMNATHRPQAWTVELAYQPVL YRQEPGIAAQL  
 LASKGIWFGSGSPSSRHAMSYKISQQTQPLSWLTLHFQYHGFYSSSTFCNYLNGEIALRF

**SEQ ID NO: 20 (pmpF)(CT870)**

MIKRTSLSFACLSFFYLSTISILQANETDTLQFRRFTFSDREIQFVLDPASLITAQNIVLSNLQ  
 SNGTGACTISGNTQTQIFSNSVNTTADSGGA FDMVTTSFTASDNANLLFCNNYCTHNKG  
 GGAIRSGGPIRFLNNQDVL FYNNISAGAKYVGTGDHNEKNRGGALYATTTTLTGNRTLAF  
 INNMSGDCGGAISADTQISITDTVKGILFENNHTLNHIPYTQAENMARGGAICSRRLCSIS  
 NNSGPIVFNYNQGGKGGAISATRCVIDNNKERIIFSNNSSLGWSQSSSASNGGAIQTTQGF  
 TLRNNKGSIFYDSNTATHAGGAINCGYIDIRDNGPVYFLNNSAAWGA AFNLSKPRSATN  
 YIHTGTGDIVFNNNVVFTLDGNLLGKRKLFHINNNEITPYTSLGAKKDTRIYFYDLFQW  
 ERVKENTSNPPSPTS RNTITVNPETEFSGAVVFSYNQMSSDIRTLMGKEHNYIKEAPTTL  
 KFGTLAIEDDAELEIFNIPFTQNPTSLLALGSGATLTVGKHGKLNITNLGVILPILKEGKSP  
 PCIRVNPQDMTQNTGTGQTPTSSTSSISTPMIIFNGRLSIVDENYESVYDSMDLSRGKAEQLI  
 LSIETTNDGQLDSNWQSSLNTSLLSPPHYGYQGLWTPNWITTTTYTTTLNNSAPT SATSI



AEQKKTSETFTPSNTTTASIPNIKASAGSGSGSASNSGEVTITKHTLVVNWAPVGYIVDPIR  
 RGDLIANSLVHSGRNMSTMGLRSLLPDNSWFALQGAATTFTKQQKRLSYHGYSSASKG  
 YTVSSQASGAHGHKFLLSFSQSSDKMKEKETNNRLSSRYYSALCFEHPMFDRIALIGAA  
 ACNYGTHNMRSFYGTKKSSKGKFHSTTLGASLRCEL RDSMPLRSIMLTPFAQALFSRTEP  
 ASIRESGLARLFTLEQAHTAVVSPIGIKGAYSSDTWPTLSWEMELAYQPTLYWKRPLLN  
 TLLIQNNGSWVTTNTPLAKHSFYGRGSHSLKFSHLKLFANYQAEVATSTVSHYINAGGA  
 LVF

**SEQ ID NO: 21 (pmpG)(CT871)**

MQTSFHKFFLSMILAYSCCSLSGGGYAAEIMIPQGIYDGETLTVSFPYTVIGDPSGTTVFSA  
 GELTLKNLDNSIAALPLSCFGNLLGSFTVLGRGHSLTFENIRTSTNGAALSDSANSGLFTIE  
 GFKELSFNCNSLLAVLPAATTNNGSQTPTTTSTPSNGTIYSKTDLLLLNNEKFSFYSNLV  
 SGDGGIDA KSLTVQGISKLCVFQENTAQAADGGACQVVT SFSAMANEAPIAFIANVAGV  
 RGGGIAAVQDGQQGVSSSTSTEDPVVSFSRNTAVEFDGNVARVGGGIYSYGNVAFLNNG  
 KTLFLNNVASPVYIAAEQPTNGQASNTSDNYGDGGAIFCKNGAQAAGSNNSGVSFSDGE  
 GVVFFSSNVAAGKGGAIYAKKLSVANCGPVQFLGNIANDGGAIYLGESGELSLSADYGD  
 IIFDGNLKR TAKENAADVNGVT VSSQAISMGS GGKITTLRAKAGHQILFNDPIEMANGNN  
 QPAQSSEPLKINDGEGYTGDIVEANGNSTLYQNV TIEQGRIVLREKAKLSVNSLSQTGGSL  
 YMEAGSTLDFVTPQPPQPPAANQLITLSNLHLSLSSLLANNAV TNPPTNPPAQDSHPAI  
 GSTTAGSVTISGPIFFEDLDDTA YDRYDWLGSN QKIDVLKLQLGTQPSANAPSDLTLGNE  
 MPKYGYQGSWKLA WDPNTANNGPYTLKATWTKTGYNPGPERVASLVPNSLWGSILDIR  
 SAHSAIQASVDGRSYCRGLWVSGVSNFFYHDRDALGQGYRYISGGYSLGANSYFGSSMF  
 GLAFTEVFGRSKDYVVCRSNHACIGSVYLSTKQALCGSYLFGDAFIRASYGFGNQHMK  
 TSYTFAEESDVRWDNNCLVGEIGVGLPIVITPSKLYL NELRPFVQAEFSYADHESFTEEGD  
 QARAFRSGHLMNLSVPVG VKFDRCSSSTHPNKYSFMGAYICDAYRTISGTQTTL SHQET  
 WTDDAFHLARHGVIVRGSMYASLTSNIEVYGHGRYEYRDTSRGYGLSAGSKVRF

**SEQ ID NO: 22 (pmpH)(CT872)**

MPFSLRSTSFCFLACLCSYSYGFASSPQVLTPNVTT PFKGDDVYLN GDCAFVN VYAGAE  
 NGSII SANGDNLTITGQNHTLSFTDSQGPVLQNYAFISAGETLTLKDFSSLMFSKNVSCGE  
 KGMISGKT V SISGAGEVIFWDNSVGYSPLSIVPASTPTPPAPAPAPAASSSLSP TVSDARKG  
 SIFSVETSLEISGVKKGV MFDNNAGNFGTVFRGNSNNNAGSGGSGSATT PSFTVKNCCKGK  
 VSFTDNVASC GGGV VYKGT VLFKDNEGGIFFRGNTAYDDLGLAATSRDQNTETGGGG  
 GVICSPDDSVKFEGNKGSIVFDYNFAKGRGGSILTKEFSLVADDSVVF SNNTAEKGGGAI  
 YAPTIDISTNGGSILFERNRAAEGGAICVSEASSGSTGNLTL SASDGDIVFSGNMTSDRPGE  
 RSAARILSDGTTVSLNASGLSKLIFYDPVVQNNSAAGASTPSPSSSSMPGAVTINQSGNGS  
 VIFTAESLTPSEKLQVLNSTSNFPGALT VSGGELVVTEGATLTGTITATSGRVTLGSGAS  
 LSAVAGAANN NYTCTVSKLGIDLESFLTPNYKTAILGADGT VTVNSGSTLDL VMESEAE  
 VYDNPLFVGSLTIPFVTLSSSSASNGVTKNSVTINDADAAHYGYQGSWSADWTKPPLAP  
 DAKGMVPPNTNNTLYLTWRPASNYGEYRLDPQRKGELVPNSLWVAGSALRTFTNGLKE  
 HYVSRDVGFVASLHALGDYILNYTQDDRDGFLARYGGFQATAASHYENGSI FGVAFGQ  
 LYGQTKSRMYYSKDAGNMTMLSCFGRSYVDIKGTETVMYWETAYGYSVHRMHTQYF  
 NDKTQKFDHSKCHWHNNNNYAFVGA EHNFL EYCIPTRQFARDYELTGFMRFEMAGGW  
 SSSTRETGSLTRYFARGSGHNMSLPIGIVAHAVSHVRRSPPSKLTLMGYRPDIWRVTPH  
 CNMEIANGVKTPIQGSPLARHAFFLEVHDTLYIHHFGRAYMNYSLDARRRQTAHFVSM  
 GLNRIF

**SEQ ID NO: 23 (pmpI)**

MRPDHMFNFCCLCAAILSS TAVLFGQDPLGETALLTKNP NHVVCTFFEDCTMESLFPALC  
 AHASQDDPLYVLGNSYCWFVSKLHITDPKEALFKEKGDL SIQNFRFLSFTDCSSKESSPSII  
 HQKNGQLSLRNNGSMSFCRNHAEGSGGAISADAFSLQHNYLFTA FEENS SKGNNGGAIQA

QTFSLSRNVSPISFARNRADLNGGAICCSNLICSGNVNPLFFTGNSATNGGAICCSIDLNTS  
 EKGSLSLACNQETLFA SNSAKEKGGAIYAKHMLRYNGPVVSFINNSAKIGGAIAIQSGGS  
 LSILAGEGSVLFQNNNSQRTSDQGLVRNAIYLEKDAILSSLEARNGDILFFDPIVQESSKES  
 PLPSSLQASVTSPTPATASPLVIQTSANRSVIFSSERLSEEEKTPDNLTSQLQQPIELKSGRL  
 VLKDRVLSAPSLSQDPQALLIMEAGTSLKTSSDLKLATLSIPLHSLDTEKSVTIHAPNLSI  
 QKIFLSNSGDENFYENVVELLSKEQNNIPLLTLSKEQSHLHLPDGNLSSHFGYQGDWTFWSW  
 KDSDEGHSLIANWTPKNYVPHPERQSTLVANTLWNTYSDMQAVQSMINTIAHGGA YLF  
 GTWGS AVSNLFY AHDSSGKPIDNWHHRSLGYLFGISTHSLDDHSFCLAAGQLLGKSSDSF  
 ITSTETTSYIATVQAQLATPLMKISAQACYNESIHELKTKYRSFSKEGFGSWHSVAVSGEV  
 CASIPTVSNGSGLFSSFSIFS KLQGFSGTQDGFEESSGEIRSFSASSFRNISLPMGITFEKKSQ  
 KTRNYYYFLGAYIQDLKRDVESGPVLLKNAVSWDAPMANLDSRAYMFRLTNQRALH  
 RLQTLLNVSYVLRGQSHSYSLDLGTTYRF

**SEQ ID NO: 24 (MOMP)(CT681)**

MKKLLKSVLVFAALSSASSLQALPVGNPAEPSLMIDGILWEGFGGDPCDPCATWCDAIS  
 MRVGYYGDFVFDRLVKTVDNKEFQMGAKPTTDTGNSAAPSTLTARENPA YGRHMQDA  
 EMFTNAACMALNIWDRFDVFCTLGATSGYLKGNSASFNLVGLFGDNENQKTVKAESVP  
NMSFDQSVVELYTDTFEAWSVGARAALWECGCATLGASEQYAQSKPKVEELNVLCNA  
 AEFTINKPKGYVGKEFPLDLTAGTDAATGTKDASIDYHEWQASLALS YRLNMFTPYIGV  
 KWSRASFDADTIRIAQPKSATAIFDTTTLNPTIAGAGDVKTGAEGQLGDTMQIVSLQLNK  
 MKSRKSCGIAVGTTIVDADKYAVTVETRLIDERA AHVNAQFRF

**SEQ ID NO: 25 CSFIGGITYL**

**SEQ ID NO: 26 SFIGGITYL**

**SEQ ID NO: 27 SIIGGITYL**

**SEQ ID NO: 28 (Cap1)(CT529)**

MASICGRLGSGTGNALKAFFTQPNNKMARVVNKTGMDKTIKVAKSAAELTANILEQA  
 GGAGSSAHITASQVSKGLGDARTVVALGNAFNGALPGTVQSAQSFFSHMKAASQKTQE  
 GDEGLTADLCVSHKRRAAAA VCSIIGGITYLATFGAIRPILFVNKMLAKPFLSSQTKANM  
 GSSVSYMAANHAASVVGAGLAISAERADCEARCARIAREESLLEVPGEENACEKKVAG  
 EKAKTFTRIKYALLTMLEKFLECVADVFKLVPLPITMGIRAI VAAGCTFTSAIIGLCTFCAR  
 A

**SEQ ID NO: 29 (groEL-like hsp60 protein)**

MVAKNIKYNEEARKKIQKGVKTLAEAVKVTLGPKGRHVVIDKSFGSPQVTKDGVTVAK  
 EVELADKHENMGAQMVKEVASKTADKAGDGT TATVLA EAIYTEGLRNV TAGANPMD  
 LKRGIDKAVKVVDQIRKISKPVQHHEIAQVATISANND AEIGNLIAEAMEKV GKNGSI  
 TVEEAKGFETVL DIVEGMNFNRGYLSSYFATNPETQECVLEDALVLIYDKKISGIKDFLPV  
 LQQVAESGRPLLIAEDIEGEALATLVVNRIRGGFRVCAVKAPGFGDRRKAMLEDIAILTG  
 GQLISEELGMKLENANLAMLGKAKKVIVSKEDTTIVEGMGEKEALEARCESIKKQIEDSS  
 SDYDKEKLQERLAKLSGGVAVIRVGAATEIEMKEKKDRVDDAQHATIAAVEEGILPGGG  
 TALIRCIPTLEAFLPMLTNEDEQIGARIVLKALSAPLKQIAANAGKEGA IIFQQVMSRSANE  
 GYDALRDAYTDMLEAGILDPKAVTRSALESAASVAGLLLTTEALIAEIP EEPKPAAPAMP  
 GAGMDY

**SEQ ID NO: 30 (omp2/omcB)**

MRIGDPMNKLIRRAVTIFA VTSVASLFASGVLETSMAESLSTNVISLADTKAKDNTSHKS  
 KKARKNH SKETPVDRKEVAPVHESKATGPKQDSCFGRMYTVKVND DRNVEITQAVPEY

ATVGSPYPIEITATGKRDCVDVIITQQLPCEAEFVRSDPATTPADGKLVWKIDRLGQGEK  
SKITVWVKPLKEGCCFTAATVVCACPEIRSVTKCGQPAICVKQEGPENACLRCPPVYKINI  
VNQGTATARNVVVENPVPDGYAHSSGQRVLTFTLGDMQPGEHRTITVEFCPLKRGRAT  
NIATVSYCGGHKNTASVTTVINEPCVQVSIAGADWSYVCKPVEYVISVSNPGDLVLRDV  
VVEDTLSPGVTVLEAAGAQISCNKVVWTVKELNPGESLQYKVLVRAQTPGQFTNNVVV  
KSCSDCGTCTSCAEATTYWKGVAAATHMCVVDTCDPVCVGENTVYRICVTNRGSAEDTN  
VSLMLKFSKELQPVSFSGPTKGTITGNTVVFDSLRLGSKETVEFSVTLKAVSAGDARGE  
AILSSDTLTVPVSDTENTHIY

**SEQ ID NO: 31**

MFRYTLRSRLFFILALFFCSACDSRSMITHGLSGRDANEIVVLLVSKGVAAQKVPQAASST  
GGSGEQLWDISVPAAQITEALAILNQAGLPRMKGTSLLDLFAKQGLVPSEMQUEKIRYQEG  
LSEQMATTIRKMDGIVDASVQISFSPEEEDQRPLTASVYIKHRGVLDNPNNSIMVSKIKRLV  
ASAVPGLCPENVSVVSDRASYS DITINGPWGLSDEMNYVSVWGILAKHSLTKFRLVFYF  
LILLFILSCGLLWVIWKTHTLISALGGTKGFFDPAPYSQLSFTQNKPPAPKETPGAEGAE  
AQTASEQPSKENAEKQEENNEDA

**SEQ ID NO 32 (CT600)**

MRKTIFKAFNLLFSLFLSSCSYPCRDWECHGCD SARPRKSSFGFVPPFYSDEEIQQA FVED  
FDSKEEQLYKTS AQSTSFRNITFATDSYSIKGEDNL TILASLVRHLHKSPKATLYIEGHTDE  
RGAAAYNLALGARRANAVKQYLIKQGIAADRLFTISYGKEHPVHPGHNELAWQQNRRT  
EFKIHAR

**SEQ ID NO 33 (CT541)**

MKNILSWMLMFAVALPIVGCDNGGGSQTSATEKSMVEDSALTDNQKLSRTFGHLLSRQ  
LSRTEDFSLDLVEVIKGMQSEIDGQSAPLTDTEYEKQMAEVQKASF EAKCSENLASAEKF  
LKENKEKAGVIELEPNKLQYRVVKEGTGRVLSGKPTALLHYTG SFIDGKV FDSSEKNKEP  
ILLPLTKVIPGFSQGMQGMKEGEVRVLYIHPDLAYGTAGQLPPNSLLIFEVKLIEANDDNV  
SVTE"

**SEQ ID NO 34 (CT623)**

MKKYFYKGFVGALLACGSTNLAF AQASSMDSQLWSVEDLDSYLSSKGFVETRKR DGV  
LRLAGDVRRARWIYAKEDLETTQTPAKPMLPTNRYRSEFNLYVDYTAANSWMTSKMNW  
VTIAGGESSAAGLDINRAFLGYRFYKNPETQAEVF AEIGRSGLG DIFDSDVQFNSNFDGIH  
LYAARRISEKL PFTMIVHGGPFV VNM AEKEYAWVVEAILNKLPGNFVVKTSVVDWNTL  
TAKTNDPADASAAQPAKPNTKYDYL VWQWL VGKSTAMPWFNGQTKNLYTYGAYLFN  
PLAEIPENWKQSTTPTTKITNGKENHAWFIGCSLGGVRRAGDWSATVRYEYVEALAIPEI  
DVAGIGRGNQMKYWFAQAIKQGLDPKESNGFTNYKGVSYQFVMGLTDSVSFRAYAA Y  
SKPANDNLGSDFTYRKYDLGLISSF

**SEQ ID NO 35 (CT700)**

MWLIVASTLLACLAMALVFKA YRHVISFRSYVNQVIRDVRLSVDLKEWAVAEMRLAPIL  
KKRQYRRKYLFEYIRILRELERFEEAEKLLGEAKKLKLAGAHFFLEVAHKAFRHGAYKE  
AAHAFSLLSAELMGEREVARYTISLVYLGEVDAACRIIEPWIGPLAHQE VFISVGHYFAT  
KRYADAIDFYRRARSLGSCPIDVLYNLAHSLRICGQYVDAGMLFRELLGDPVYKDEAMF  
NIGLCEQKLGNSKKALLIYQNS ELWVRGDALMMRYAALAAADQQDYQLAEHCWTLAF  
RCQSYADDWNCCVHYGLALCHLKKYAEAEKVYLRVIQKTPDCLVACKALAWLAGVG  
HATMISAREGIAYAKRALQIKRSPEVLELLSACEAREGNFDVAYDIQAILAERD TTAKER  
ERRSQILKNLRQKLPIDQQHIVEVSLLAA

**SEQ ID NO 36 (CT266)**



MLVESQLGLEDVLEAFSERNFEDIQSKSFIESFQDKKLRRRTVIQRFLHHPLLHHDIARAAAYL  
 LAALEEGVDLGYQFLCMHQTQSGAALLFRRAGFLWGGLPYPGEHAEMAMLLSRIAIFY  
 DTSYEQVQKMIAFQHALFSHERNIFPALWSQEGSRSNQEKTAVSKLLFCQKEARIEDQFT  
 LTDMSLGFWMRRTPSFSA YVSGSGCKSGVGAFLIGDVGVNLNYGPCVGDGPGECLGFGLC  
 GQVKEFSCQEKDEEVSI SFAGALSQPSSRRTGFSYLQDALFSTNSCYCIDITEQKCHVASS  
 LDRENQDAFFAIFCKGSQCQVCNGPKLRTGSPDSYKGPA YDVLKGEKETVRILSSSPHM  
 EIFSLQGKDRFWGSNFLNL PYTQNSINILFEKA

**SEQ ID NO 37 (CT077)**

MGKFFASYLLILAPFFLQSCSAPSRTTLEGVRMTIPYRIVFGEALSPDAFQQAQKEIDRVF  
 DHIDQTFNNWNPLSEISRINRTTKQTPIPLSPALFAFLCEIDHFHAFSDGRFDPTLGALKSL  
 WLLHLKSHTIPSQELQHL YKHSSGWHLISLDKTQQTLRKLSPLVQLDLCGT VKGFAVDL  
 LGTACAQFCQNY YVEWGGEIKTKGKHPSGRSWAVASSATPEILHLHDHAIATSGSQYQR  
 WHVDNKTYTHILDPLTGTPLEDSSHPILAVSVINESCAFADAMATALTTFSSKQEALDWA  
 NKKHLCA YTTDKNVS

**SEQ ID NO 38 (CT456)**

~~MTNSISGYOPTVTTSTSTTSASGASGSLGASSVSTTANATVTQTANATNSAATSSSIQTTG~~  
 ETVVNYTNSASAPNVTVSTSSSSTQATATSNKTSQAVAGKITSPDTSESSETSSSTSSSDHIP  
 SDYDDVGSNSGDISNNYDDVGSNNGDISSNYDDAAADYEPIRTTENIYESIGGSRTSGPEN  
 TSGGAAAALNSLRGSSYSNYDDAAADYEPIRTTENIYESIGGSRTSGPENTSGGAAAALN  
 SLRGSSYSNYDDAAADYEPIRTTENIYESIGGSRTSGPENTSDGAAAALNSLRGSSYTTG  
 PRNEGVFGPGPEGLPDMSLPSYDPTNKTSLLTFLSNPHVKS SKMLENSGHFVFIDTDRSSFI  
 LVPNGNWDQVCSIKVQNGKTKEDLDIKDLENMCAKFCTGFSKFSGDWDSLVEPMVSAK  
 AGVASGGNLPNTVIINNKFKTCVAYGPWNSQEASSGYTPSAWRRGHRVDFGGIFEKAND  
 FNKINWGTQAGPSEDDGISFSNETPGAGPAAAPSPTPSSIPINNVNVNVGGTNVNIGDTNV  
 NTTNTTPTTQSTDASTDTSDIDDINTNNQTDDINTTDKDS DGAGGVNGDISETESSSGDDS  
 GSVSSSESDKNASVGNDGPAMKDILSAVRKHLDVVYPGENGGSTEGPLPANQTLGDVIS  
 DVENKGSAQDTKLSGNTGAGDDDPTTTAAVGNNGAEITLSDTDSGIGDDVSDTASSSGD  
 ESGGVSSPSES NKNTAVGNDGPSGLDILAAVRKHLDKVYPGDNGGSTEGPLQANQTLG  
 DIVQDMETTGTSTQETVVSPWKGSTSSTESAGGSGSVQTLSPPPPTPSTTTLRTGTGATTT  
 SLMMGGPIKADIITTTGGGGRIPIGGGTLEKLLPRIRAHLDISFDAQGD LVSTEEPQLGSIVNK  
 FRQETGSRGILAFVESAPGKPGSAQVLTGTGGDKGNLFQAAAAVTQALGNVAGKVNLA  
 IQGQKLSSLVNDDGKGSVGRDLFQAAAQTTQVLSALIDTVG

**SEQ ID NO 39 (CT165)**

MFQPETVPSNRSTETTPQNIEVYNDNRNFTNHTTEDVIRIGERLQRQFYNMTEESRVPFTTS  
 PSHHTGNWKTAFLYNLSQVVAHIFPSTVQPIRVKPTRIPPSPTPPPEGTTTAETSTSENKVT  
 TISKEQEVTTKPLLVRERRSLLHSQ

**SEQ ID NO 40 (CT713)**

MSSKLVNYLRLTFLSFLGIASSTLDAMPAGNPAPFPVIPGINIEQKNACSFDCNSYDVLSA  
 LSGNLKLCFCGDYIFSEEAVKDVVPVTSVTTAGVGPSPDITSTTKTRNFDLVN CNLNTN  
 CVAVAFSLPDRSLSAIPLFDVSFEVKVGGLKQYYRLPMNAYRDFTSEPLNSESEVTDGMI  
 EVQSNGYGFVWDVSLKKVIWKDGVSVFVGVGADYRHASCPIDYIIANSQANPEVFIADSDG  
 KLNFKESVVCVGLTTYVNDYVLPYLA FSIGSVSRQAPDDSFKKLED RFTNLKFKVRKITS  
 SHRGNICIGATNYVADNFFYNVEGRWGSQRAVNVSGGFQF

**SEQ ID NO 41 (CT082)**

MSISGSGNVSPATPDFDPSILMGRQAASAHAAKEASGASKATETSAAEQQALISSGTELD  
 YVTDLQQSEGKYKKTLDKTSKSPKTKLKGNFSKVRAGTKGFLTGFGTTRASRISARKAEN

NGEGMSMIPSQMEYVKKKGNRVSPMQNFYLGASGLWSPTSDVSSITENCLGATALSTT  
 PLLTTMQDPVSIHLSSGEITALASFNPVVRTASLNEQTINAWTEARLGEMVSTLLDPNI  
 ETSSLLRRAPTVSNEGMVDVSDMGNQTTSLSMEGLVNTVVDDPASAEKKKTGELSLEE  
 MAAMAKMMAALLSSGQGMVFIASSTPSSGLTQFPEPKFSGTIPHHFSKKEDNETIWGL  
 DSQIGSIAFDTRRENNASPLPTTSLHEEASYPFVGEAPLDVNEIPFAVQHSTVFSKETANT  
 EQALIQNESLGEIPVSAEVVGQDTVSSAYQFPSHLGMAVLASVPLSTEDYKTAVEHRKGP  
 GGPPDPLIYQYRNVAVDPAIIFQSPSPFSVSSRFSVQKGPEAVAVYNDQEEAAGGNRDS  
 DEGKDQEQDKTRETEDAGGDS

#### SEQ ID NO 42 (CT181)

MLSKFCKLSLSAILLINTLAPSETFSEEGTSGFLGRMKSWILKDKTILSTTEESQTSIAIEKVS  
 DLLSWKRYDYTQESGFAIQFPESPEHSEQVIEVPQSDLAIRYDTYVAETPSDSTVYVVSIV  
 EYPEKIDISRPELNLQEGFAGMLYALPESQVLYLKATALQGHKALEFWIACDDVYFRGM  
 LVSVNHTLYQVFMVYKGRSPEILDKEYSTFIQSFKVTKVRNSKKMDIRKRVSL

#### SEQ ID NO 43 (CT050)

MNDTKNNISSSFWNPNKVVTKVLLKVSETGIESTPGIVKHNQLITQSENPTDPTDAVTFK  
YLKENYTKENDPNPGFLPTTGGTMTGDIDMQGNNVTDIVMYTNGQQNPTDDSAVTIGY  
 LNEKADEIKSNDQITTA VAGLSNNSQISTLHQLLGIAEDPDTVTNPDLKTSGGTVYEDI  
 DMSSNTVSDLGTPTNKDTKSAINVEFVQAKITSPQMAFLKNNDTNLSNITVSEYFNWLQ  
 DPTQAPTPEPDPDPEPAPEPEPDTSDSSGSGSENPA DPAPTNPSPDSNAQNNPTPSSNGATAS  
 IRKLAATTTTVPTDTEIAPAAEDPNLPNTTFSEKSPLWEEFFSFSDDSSRSEMVIQKTGILTFS  
 MQGTWENPSSSQTPSTDPISELTVTPTTDTTPPESPPSPPEAPAPEATPSPTNNNLTAITK  
 TFSRKYNLSATPSPTPTTPTPTPTITKTLSSLSSGQSCTLQIPVQATRSVLKLKYVNPNNNSS  
 GGSSGSGGSSQPETTPTGITLQSFSWSLVLTPEITKATSTPSTPSQP

#### SEQ ID NO 44 (CT157)

MSVQGSSSLKYSDLFKPPEPTSSTDSSKEPPKESAWKVVS HSRGRRRRARSNPSPHTSQNT  
 SPKDSSLVARTDKAATDIFNSAKHKAJETTKRSDQQSRSLHILHLLAENPEPIVFHSAHQ  
 NHNDPQRM LCDAILQANRIITMRIFNIGSPEIRALIRAVRRNIPVVVSAWNFPNLSNWDR  
 ESELCVELRGNPQICLHKKTTLIDNQLTIIGTANYTKSSFFKDINLTALIQNPALYSLILSDT  
 RGSVSGSQTISYYPLFPQSN TKILPIIQEIQKAQRTIKIAMNIFSHTEIFLALEQARLRGVTI  
 TIVINKKESAHTLDILHRISALLLKS VTTVDLSLHAKICLIDNQLIFGSPNWTYHGMHKN  
 LEDLLIVTPLTPKQIHISIQEIWAFLKNSSPV

#### SEQ ID NO 45 (CT128)

MDRSPLFLIIMGAPGSGKGTQSKLLASQLSLLHISSGDLLRDAVSKDTPLSQEIKSYLDQG  
 KLLPDTLVWKL VHEKLDEFQQDTLLRRLSFLSRSENSAILDGFPRTVTQAKLLHEFLSSYF  
 PNYKVILLDISDEEVLNRLTSRYICPACQGIYNEQQGFSSCPKCSVELIRRSDDTLEVILDRI  
 QTYKQETQPVLDYYTEKQKLITIDANAPTQQVFQSILDSLSASLVYQERDCCNCDDED

#### SEQ ID NO 46 (CT153)

MTKPSFLYVIQPFVFNPR LGRFSTDSDTYIEEENRLASFIESLPLEIFDIPSFMETAISNSPYI  
 LSWETTKDGALFTILEPKLSACAATCLVAPSIQMKSDAELLEIKQALLRSSHDGVKYRIT  
 RESFSPEKKTPKVALVDDDIELIRNVDFLGRAVDIVKLDPINILNTVSEENILDYSFTRETA  
 QLSADGRFGIPPGTKLFPKPSFDVEISTSI FEETTSFTRSFASVTFSPDLAATMPLQSPPM  
 VENGQKEICVIQKHLFPSYSPKLVDIVKRYKREAKILINKLAFGMLWRHRAKSQILTEGS  
 VRLDLQGFTESKYN YQIQVGSHTIAAVLIDMDISKIQSKSEQAYAIRKIKSGFQSLDDYH  
 IYQIERKQTFSPKHSLSSTSHSESDLDLSEAAAFSGSLTCEFVKKSTQHAKNTVTCST  
 AAHSLYTLKEDDSSNPSEKRLDSCFRNWIKLSANSPDSWSAFIQKFGTHYIASATFGGI  
 GFQVLKLSFEQVEDLHKKISLETA AANSLLKGSVSSSTESGYSSYSSTSSHTVFLGGTV

LPSVHDERLDFKDWSESVHLEPVPIQVSLQPITNLLVPLHFPNIGAAELSNKRESLQQAIR  
 VYLKEHKVDEQGERTTFTSGIDNPSSWFTLEAAHSPLIVSTPYIASWSTLPYLFPTLRERSS  
 ATPIVFYFCVDNNEHASQKILNQS YCFLGSLPIRQKIFGSEFASFPYLSFYGNAKEAYFDNT  
 YYPTRCGWIVEKLNTTQDQFLRDGDEVRLKHVSSGKYLATTPLK DTHGTLTRTTNCEDA  
 IFIIKKSSGY

**SEQ ID NO 47 (CT262)**

MKKFLLLSLMSLSSLPTFAANSTGTIGIVNLRRCLEESALGKKESA EF EK MKNQFSNSMG  
 KMEEELSSIY SKLQDDDYMEGLSETAAAE LRKKFEDLSAEYNTAQGGYYQILNQSNLKR  
 MQKIMEEVKKASETVRIQEGLSVLLNEDIVLSIDSSADKTD A VIKVLDDSFQNN

**SEQ ID NO 48 (CT276)**

MFKRPAKNFFDEVQTL YEDSGANSTSY SIYPQRTERLENH SNIFEPAKPAETRLLSQEEHS  
 QWTDQQEELATQESSFPEEPETTLGEGVSFKGELT FERLLRIDGT FEGILVSKGKIIVGPQG  
 YVKANIELEEAVIAGVVEGNITVTGRVSLQGRAMVTGDIQAGSLCVDEGVRLCGYVSIQ  
 GAPSNEQEEIDS

**SEQ ID NO 49 (CT296)**

MRAVLHLEHKRYFQNHGHILFEGLAPVSDCKQLEAELKLFLKEVAVVKDRHLQRWREN  
 VHRTLPEVQMIVKRVRLDHLAAELTHRSRVALVRDLWVQKQEEIFFDDCDCSVLLCLSG  
 EKAGWGLFFSGEYPQDVFNWGAGDTAILRFSSAGFPN

**SEQ ID NO 50 (CT372)**

MQAAHHHYHRYTDKLHRQNHKKDLISPKPTEQEACNTSSLSKELIPLSEQRGLLSPICDFI  
 SERPCLHGVSVRNLKQALKNSAGTQIALDWSILPQWFNPRVSHAPKLSIRDFGYSAHQTV  
 TEATPPCWQNCFNPSAAVTIYDSSYGKG V FQISYTLVRYWRENAATAGDAMMLAGSIN  
 DYPSRQNIQSQFTFSQNFPNERVSLTIGQYSLY AIDGTLYNNDQQLGFISYALSQNPTATYS  
 SGSLGAYLQVAPTASTSLQIGFQDAYNISGSSIKWSNLTKNRYNFHGFASWAPRCCLGSG  
 QYSVLLYVTRQVPEQMEQTMGWSVNASQHISSKLYVFGRYSGVTGHVFPINRTYSFGM  
 ASANLFNRNPQDLFGIACAFNNVHLSASPNTKRKYETVIEGFATIGCGPYLSFAPDFQLYL  
 YPALRPNKQSARVYSVRANLAI

**SEQ ID NO 51 (CT412)**

MNRVIEIHAHYDQRQLSQSPNTNFLVHHPYLTLIPKFLLGALIVYAPYSFAEMELAISGHK  
 QGKDRDTFTMISSCPEGTNYIINRKLILSDFSLLNKVSSGGAFRNLAGKISFLGKNSSASIH  
 FKHININGFGAGVFSESSIEFTDLRKLVAFGSESTGGIFTAKEDISFKNNHHIAFRNNITKGN  
 GGVIQLQGDMKGSVSFVDQRGAIIFTNNQAVTSSSMKHSRGGGAISGDFAGSRILFLNNQ  
 QITFEGNSAVHGGAIYNKNGLVEFLGNAGPLAFKENTTIANGGAIYTSNFKANQQTSPILF  
 SQNHANKKGGAIYAQYVNLEQNQDTIRFEKNTAKEGGGAI TSSQCSITAHNTIIFSDNAA  
 GDLGGGAILLEGKKPSLTIAHSGNIAFSGNTMLHITKKASLDRHNSILIKEAPYKIQ LAA  
 NKNHSIHFFDPVMALSASSSPIQINAPEYETPFFSPKGMIVFSGANLLDDAREDVANRTSIF  
 NQPVHLYNGTLSIENG A HLIVQSFKQTGGRISLSPGSSLALYTMNSFFHGNISSKEPLEING  
 LSFGVDISPSNLQAEIRAGNAPLRLSGSPSIHDPEGLFYENRDTAASPYQMEILLTSDKIVDI  
 SKFTTDSLVTNKQSGFQGAWHFSWQPNTINNTKQKILRASWLPTGEYVLESNRVGRAVP  
 NSLWSTFLLLQTASHNLGDHLCNNRSLIPTS YFGVLIGGTGAEMSTHSSEEESFISRLGAT  
 GTSIIRLTPSLTLSGGGSHMFGDSFVADLPEHITSEGIVQNVGLTHVWGPLTVNSTLCAAL  
 DHNAMVRICKKDH TYGKWDTFGMRGTLGASYTFLEYDQTMRVFSFANIEATNILQRA  
 FTETGYNPRSFSKTKLLNIAIPIGIGYEFCLGNSSFALLGKG SIGYSRDIKREN PSTLAHLAM  
 NDFAWTTNGCSVPTSAHTLANQLILRYKACSLYITAYTINREGKNLSNSLSCGGYVGF

**SEQ ID NO 52 (CT480)**



MIDKIIRTLVLSLFLLYWSSDLLEKDVKSIKRELKALHEDVLELVRISHQQKNWVQSTDF  
SVSPEISVLKDCGDPAPFNLLCEDPYVEKVVPSSLKEGFVPGILRTAQVGRPDNLSPFNG  
FVNIVRFYELCVPNLAVEHVGKYEEFAPSLALKIEEHYVEDGSGDKEFHILRPNMFWEP  
IDPTLFPKNITLADSFLRPHPVTAHDVKFYDVMNPYVAEMRAVAMRSYFEDMVSVR  
VENDLKLIVRWRAHTVRNEQGEEEEKVLYSAFANTLALQPLPCFVYQHFANGEKIVPED  
SDPD TYRKDSVWAQNFSSHWAYNYIVSCGAFRFAGMDDEKITLVRNP NYHNPFAALVE  
KRYIYMKDSTDSL FQDFKAGKVDIAYFPPNHVDNLASF MQTSA YKEQAARGE AILEKNS  
SDRSYSYIGWNCLSLFFNNRSVRQAMNMLIDRDRIIEQCLDGRGVSVSGPFSLCSPSYNR  
DVEGWQYSPEEAARKLEEEGWIDADGDGIREKVIDGVVVPFRFRLCYVVKSVTARTIAE  
YVATVCKEVGIECCLGLDMADYSQALEEKNFDAILSGWCLGTPPEDPRALWHSEGALE  
KGSANAVGFCNEEADRIIEQLSYEYDSNKRQALYHRFHEVIHEESPYAFLYSRQYSLVYK  
EFVKNIFVPTEHQDLIPGAQDET VNLSMLWVDKEEGRCSAIS

**SEQ ID NO 53 (CT548)**

MLKMFWLNSLVFFSLLLSACGYTVLSPHYVEKKFSLSEGIYVCPIEGDSLGLDVSSLSYEL  
EKRGLHTRSQGTSSGYVLKVSLFNETDENIGFAYTPQKPDEKPVKHFIVSNEGRLALSAK  
VQLIKNRTQEILVEKCLRKSVTFDFQPD LGTANAHQLALGQFEMHNEAIKSASRILYSQL  
AETIVQQVYYDLF

**SEQ ID NO 54 (CT043)**

MSRQNAEENLKNFAKELKLPDVAFDQNNTCILFVDGEFSLHLTYEEHSDRLYVYAPLLD  
GLPDNPQRRALAYEKLLEGSM LGGQMAGGGVGVATKEQLILMHCVLDMKYAETNLLK  
AFAQLFIETVVKWRTVCSDISAGREPTVDTMPQMPQGGGGGGIQQPPAGIRA

**SEQ ID NO 55 (CT635)**

MKNNSAQKIIDS IKQILSIYKIDFEP SFGATLTDDNDLDYQMLIEKTQE KIQELDKRSQEIL  
QQTGMTREQMEVFANNPDNFSPEEWRALENIRSSCNEYKKETEELIKEVTNDIGHSSHKS  
PTPKKTKSSSQKKSKKKKNWIPL

**SEQ ID NO 56 (CT859)**

MRKIILCSPRGFCAGVIRAIQTVEVALEKWGRPIYVKHEIVHNRHVVDKLREKGAIFIEDL  
QEVPRNSRVIFSAHGVPPSVREEAEERGLI AIDATCGLVTKVHSAVKMYAKKGYHIILIGK  
RKHVEIIGIRGEAPDQITVVENIAEVEALPFS AQDPLFYVTQTTL SMDDAADIVAALKARY  
PRIFTLPSSSICYATQNRQGALRNILPQVDFVYVIGDTQSSNSNRLREVAERRGV TARLVN  
HPDEVTEEILQYSGNIGITAGASTPEDVVQACLMKLQELIPDL SIEMDLFVEEDTVFQLPK  
EL

**SEQ ID NO 57 (CT671)**

MELNKTSESLFSAKIDHNHPRTEAHEPRDQREVRVFSLEGRSSTRQEKADRMPGRTSSRQ  
ESSKGSEEGAVHESTAGVSSKEEEESKGDGFFTGGNPTSGMALVETPMAVVSEAMVETS  
TMTVSQVDLQWVEQLVTSTVESLLVADIDGKQLVEIVLDNSNTVPAAFCGANLTLVQTG  
EEISVSFSNFVDQAQLTEATQLVQQNPKQLVSLVESL KARQLNLTEL VVGNAVAVSLPTIE  
KIETPLHMIAATIRHHDQEGDQEGEGRQDQHQQHQQHQQEKKVEEAHI

**SEQ ID NO 58 (CT016)**

MKVKINDQFICISPYISARWNQIAFIESCDGGTEGGITLKLHLIDGETVSIPNLGQAIVDEVF  
QEHLLEYLESTAPQKNKEEEKISSLLGAVQQMAKGCEVQVFSQKGLVSMLLGAGSINVL  
LQHSPEHKDHPDLPTDLLERIAQMMRSLSIGPTSILAKPEPHCNCLHCQIGRATVEEEDAG  
VSDEDLTFRSWDISQS GEKMYTVTDPLNPEEQFNVYLGTPIGCTCGQPYCEHV KAVLYT

**SEQ ID NO 59 (CT017)**

MLIFALSFGADACLCAADLSKAKVEASVGDRAAFSPFTGEIKGNRVRLRLAPHTDSFIIKE  
LSKGDCLAVLGESKDYYVVAAPGVRGYVFRTFVLDNVIEGEKVNVRLEPSTSAPILARL  
SKGTVVKTLGAAQGKWIEIALPKQCVFYVAKNFVKNVGALDLYNQKEGQKKLALDLLS  
SAMDFAEALQKKIEDIDLDAIYKKMNLAQSEEFKDVPGLQSLVQKALERVQEAFLAKS  
LEKSSVKVPEIRHKVLEEIAVVSPA VEETPVVTKTEEQKVTTVPVPAPAVVTEPAQDLSSV  
KGSLLSHYIRKKGFVKASPVIEGRESFERSLFAVWLSLQPEERHQLTMESFYRDEQKKKR  
VLTGELEVYPHIVKNNPGDYLLKNGEDVVA FVYATSIDLSKWLGKSVVLECVSRPNNHF  
AFPAYIVLSVKEGA

**SEQ ID NO 60 (CT043)**

MSRQNAEENLKNFAKELKLPDVAFDQNNTCILFVDGEFSLHLYEEHSDRLYVYAPLLD  
GLPDNPQRRALALYEKLLLEGSM LGGQMAGGGVGVATKEQLILMHCVLDMKYAETNLLK  
AFAQLFIETVVKWRTVCSDISAGREPTVDTMPQMPQGGGGGIQPPAGIRA

**SEQ ID NO 61 (CT548)**

MLKMFWLNSLVFFSLLLSACGYTVLSPHYVEKKFSLSEGIYVCPIEGDSLGDLVSSLSYEL  
EKRGLHTRSQGTSSGYVLKVSLFNETDENIGFAYTPQKPDEKPVKHFIVSNEGRLALSAK  
VQLIKNRTQEILVEKCLRKSVTFDFQPD LGTANAHQLALGO FEMHNEAIKSASRILYSQL  
AETIVQQVYYDLF